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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
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| 09/872,776 | 06/01/2001 | Thomas G. Herron | NPW 308B | 1938 |

7590 03/16/2004

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EXAMINER

RUTHKOSKY, MARK

| | |
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| ART UNIT | PAPER NUMBER |
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1745

DATE MAILED: 03/16/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/872,776

Applicant(s)

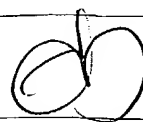
HERRON

Examiner

Mark Ruthkosky

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 27 July 2001.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-43 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-43 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- ☒ Notice of References Cited (PTO-892)
- ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date 1, 4.
- ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
- ☐ Notice of Informal Patent Application (PTO-152)
- ☐ Other: _____.

DETAILED ACTION

Priority

The application is a continuation of U.S. application 09/414,048, now U.S. patent 6,242,120.

Information Disclosure Statement

The information disclosure statements filed 6/1/2001 and 7/27/2001 have been placed in the application file, and the information referred to therein has been considered as to the merits.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for a patent.

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

Claims 1, 2, 5-26, 35 and 43 are rejected under 35 U.S.C. 102(b) as being anticipated by Meltser et al. (US 5,763,113.)

The instant claims are to a fuel cell system comprising a source of hydrogen gas; a fuel cell stack including at least one fuel cell adapted to receive a flow containing hydrogen gas from

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the source and to produce an electric current therefrom; a purge assembly including at least one purge valve adapted to selectively purge the fuel cell stack to reduce the concentration of a selected composition therein; a sensor assembly including at least one sensor adapted to measure a value of a process parameter representative of the performance of the fuel cell stack; and a controller adapted to actuate the purge assembly if the value of the process parameter exceeds a determined value.

Meltser et al. (US 5,763,113) teaches a fuel cell system comprising a source of hydrogen gas; a fuel cell stack including at least one fuel cell adapted to receive a flow continuing hydrogen gas from the source and to produce an electric current therefrom; a purge assembly including at least one purge valve adapted to selectively purge the fuel cell stack to reduce the concentration of a selected composition therein; a sensor assembly including at least one sensor adapted to measure a value of a process parameter representative of the performance of the fuel cell stack; and a controller adapted to actuate the purge assembly if the value of the process parameter exceeds a determined value (col. 2, lines 1-35; col. 3, lines 40-50; col. 5, lines 20-55; col. 6, lines 1-45; col. 7, lines 15-50; col. 8, line 7-40 and the claims.) The system is taught to purge water and CO. Various parameters are monitored to determine the measures taken to adjust the fuel cell in operation including flow rate, hydrogen concentrations, current, stack voltage; change in stack voltage; voltage between individual cells, power demand and hydrogen leakage. Sensors are noted throughout the reference (see col. 4, for example.) The controller may be a digital CPU, which stores, compares and calculates data (col. 5.) A CPU will include a display monitor. The user inputs various instruction, programming (col. 5) and values (col. 6, lines 45-end.) The user is alerted of fuel cell malfunction by a signal, alarm or light and

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appropriate action is taken (col. 4, lines 40-50.) With regard to claim 9, the reference does not teach the process parameter to be a rate in which water is produced. The references do teach other parameters including the electrical output of the stack. As the formation of water is a byproduct of the oxygen reduction, the formation and therefore the rate of water formation would be inherent to the electrical output as monitored in the reference. Thus the claims are anticipated.

Claims 1, 2, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 35, 36, 37, 38, 39 and 43 are rejected under 35 U.S.C. 102(b) as being anticipated by Perry, Jr. et al. (US 5,316,869.)

Perry, Jr. et al. (US 5,316,869) teaches a management system for a fuel cell comprising a source of hydrogen gas; a fuel cell stack including at least one fuel cell adapted to receive a flow containing hydrogen gas from the source and to produce an electric current therefrom; a purge assembly including at least one purge valve adapted to selectively purge the fuel cell stack to reduce the concentration of a selected composition therein (col. 7, lines 43-end); a sensor assembly including at least one sensor adapted to measure a value of a process parameter representative of the performance of the fuel cell stack (temperature, pressure, flood and flow sensors are noted col. 6, lines 35-end; col. 7-col. 9, figures 1-3, the claims); and a controller adapted to actuate the purge assembly if the value of the process parameter exceeds a determined value (col. 2, lines 38-60). The system includes a CPU with values input from the operator to control the function of the system. A hydrogen storage unit is noted (col. 4, lines 15-30) which may also include a hydride system. The system may be used in conjunction with PEM and alkaline fuel cells (col. 1, lines 15-65.) With regard to claim 9, the reference does not teach the

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process parameter to be a rate in which water is produced. The references do teach other parameters including the electrical output of the stack. As the formation of water is a byproduct of the oxygen reduction, the formation and therefore the rate of water formation would be inherent to the electrical output as monitored in the reference. Thus, the claims are anticipated.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 3-4 are rejected under 35 U.S.C. 103(a) as being unpatentable over Meltser et al. (US 5,763,113) OR Perry, Jr. et al. (US 5,316,869.)

The teachings of Meltser et al. (US 5,763,113) and Perry, Jr. et al. (US 5,316,869) have been presented. With regard to claims 3-4, the reference does not teach the selected purge composition to be nitrogen or methane. The references teach a means for removing harmful product from a fuel cell stack by sensing conditions of the stack and purging the harmful products from the stack. Methane is a well-known poison for fuel cell catalysts. Nitrogen is well described to inhibit the fuel and oxidant from reacting with the catalyst layers of a fuel cell. It would be obvious to one of ordinary skill in the art at the time the invention was made to remove methane, nitrogen, water or other undesirable products from a fuel cell by purging the fuel cell according to the methods of the prior art. Using the means taught in Meltser et al. (US

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5,763,113) and Perry, Jr. et al. (US 5,316,869), one of ordinary skill in the art will detect that these harmful products are damaging the performance of the fuel cell and have the means to purge the flow lines in accordance with the teachings of the art. The artisan would have found the claimed invention to be obvious in light of the teachings of the references.

Claims 32-34 and 40-42 are rejected under 35 U.S.C. 103(a) as being unpatentable over Meltser et al. (US 5,763,113) OR Perry, Jr. et al. (US 5,316,869) in view of Matusumura et al. (US 5,993,984.)

The teachings of Meltser et al. (US 5,763,113) and Perry, Jr. et al. (US 5,316,869) have been presented. With regard to claims 32-34 and 40-42, the references are silent to the source of hydrogen for the hydrogen gas of the fuel cell. Matusumura et al. (US 5,993,984) teaches a fuel cell power generating system with a reforming unit that oxidizes a carbon containing feedstock to produce a fuel (see the claims.) The reference teaches that the method may be use as an alternative to pyrolysis of a carbon-containing feedstock (col. 11, lines 25-50.) It would be obvious to one of ordinary skill in the art at the time the invention was made to use a fuel processor to prepare a hydrogen fuel from a carbon feedstock as reforming fuels such as methane and methanol are well described in the art as a source for fuel in fuel cell systems. One of ordinary skill in the art would recognize from the teachings of the art to use a carbon feedstock as shown in Matusumura et al. (US 5,993,984,) as a fuel in the fuel cells of Meltser et al. (US 5,763,113) OR Perry, Jr. et al. (US 5,316,869) as the hydrogen produced from the feed will fuel the fuel cells in an equivalent manner. The artisan would have found the claimed invention to be obvious in light of the teachings of the references.

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Conclusion

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. The cited art does not read upon the instant claims, however, the references include general teachings and relevant features as to the state of the art at the time of the invention.

Examiner Correspondence

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Mark Ruthkosky whose telephone number is 571-272-1291. The examiner can normally be reached on FLEX schedule (generally, Monday-Thursday from 9:00-6:30.) If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Patrick Ryan can be reached at 571-272-1292. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free.)

Mark Ruthkosky
Primary Patent Examiner
Art Unit 1745

Mark Ruthkosky
3/5/04